(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 805 079 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
11.06.2003 Bulletin 2003/24

(51) Int Cl.[7]: **B60T 7/06**, B60R 21/09

(21) Application number: **97107073.5**

(22) Date of filing: **29.04.1997**

(54) **Pedal support structure for a vehicle**

Tragkonstruktion eines Fahrzeugpedals

Cadre de support d'une pédale d'un véhicule

(84) Designated Contracting States:
DE FR GB

(30) Priority: **30.04.1996 JP 10977596**

(43) Date of publication of application:
05.11.1997 Bulletin 1997/45

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- **DATABASE WPI Section PQ, Week 9712 Derwent Publications Ltd., London, GB; Class Q17, AN 97-128081 XP002059149 & JP 09 011 826 A (MITSUBISHI MOTOR CORP) , 14 January 1997**

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BACKGROUND OF THE INVENTION

Field of the Invention:

[0001] The present invention relates to a pedal support structure for a vehicle.

Description of the Related Art:

[0002] Various kinds of measures have been considered as countermeasures in cases where an external force greater than a predetermined value acts on the vehicle from the front side thereof. One example of such a structure is disclosed in Japanese Utility Model Application Laid-Open (JP-A) No. 1-73464.

[0003] As shown in FIG. 5, according to the structure disclosed in the above-cited publication, a steering column 402 covering a steering shaft 400 is supported on the vehicle body side via a tilt bracket 408 comprised of an upper plate member 404 and a pair of side plate members 406, as well as via a shaft 410, which penetrates through the side plate members 406 so as to support the bottom edge of the steering column 402.

[0004] Further, an elastically deformable knee protector 412 having a substantially arc shape is disposed under the above-described tilt bracket 408. This knee protector 412 is elastically supported on the lower side of the steering column 402 via an elastically deformable stay 414.

[0005] According to the above-described structure, when an external force greater than a predetermined value acts on the vehicle from the front side thereof, an inertial force acts on an occupant such that the occupant moves toward the front of the vehicle. Accordingly, the occupant's legs tend to inertially move toward the front of the vehicle while bending about the knees. In this case, if the knee protector 412 was not disposed, the occupant's knees would contact the tilt bracket 408. By contrast, when the knee protector 412 is disposed under the tilt bracket 408 as described above, the knee(s) of the occupant will only contact the knee protector 412.

[0006] The above-described structure employing the knee protector 412 may be effective as countermeasures in cases where an external force greater than a predetermined value acting on the vehicle from the front side thereof. However, there are any other measures approached from a different point of view as countermeasures relating to occupant's legs. For multilevel protection, it is important to provide multiple measures relating to occupant's legs.

[0007] US-A-3 025 713 discloses a brake actuating mechanism for motor vehicles which comprises foot operated service brakes and hand operated emergency brakes and utilizes, in the case that the service brakes should, due to a lack of hydraulic pressure, fail to function, the extended length of the pedal stroke to operate the mechanical emergency brakes.

[0008] EP-A-0 788 931 which is part of the state of art according to Article 54 (3) EPC describes a supporting structure of a pedal device for a vehicle which includes a pedal bracket and a displacement controlling device. The pedal bracket is fixed to the vehicle body and supports a rotating shaft portion of a suspended-type pedal device. The displacement controlling device transmits an external force of a predetermined value or greater to the rotating shaft portion when the external force is applied to a front portion of the vehicle and controls the displacement of a foot pad of the pedal device such that the rotating shaft portion is moved substantially toward the rear of the vehicle.

SUMMARY OF THE INVENTION

[0009] In view of the above, it is an object of the present invention to provide a pedal support structure for a vehicle capable of controlling the displacement of the pad of a vehicle pedal when an external force greater than a predetermined value acts on the vehicle from the front side thereof.

[0010] According to a first aspect of the present invention, there is provided a pedal support structure for a vehicle comprising: a pedal bracket fixed on a vehicle body and supporting a rotation-center shaft of a suspension type vehicle pedal; a swing link which is supported by the pedal bracket in a manner swingable about a swing-center shaft and one end portion of which is connected to operating-force transmission means for transmitting a treading force applied to the pad of the vehicle pedal to treading-force boosting means; a connecting link which connects the other end portion of the swing link and one end portion of the vehicle pedal opposite to the pad in a relatively rotatable manner, which transmits a rotational force of the vehicle pedal, generated about a rotation-center shaft of the vehicle pedal and toward the front of the vehicle, to the operating-force transmission means via the swing link, and in which a connecting pin for connection with the end portion of the vehicle pedal opposite to the pad is offset substantially toward the front of the vehicle from a line connecting the rotation-center shaft of the vehicle pedal and the swing-center shaft of the swing link; and displacement control means which operates, when an external force greater than a predetermined value acts on the front portion of the vehicle, so as to increase the distance between the rotation-center shaft and the swing-center shaft and to move the connecting pin such that the connecting pin approaches the line, thereby displacing the pad of the vehicle pedal, wherein the pedal bracket includes a first pedal bracket portion and a second pedal bracket portion, the first pedal bracket portion supporting the rotation-center shaft of the vehicle pedal and the second pedal bracket portion supporting the swing - center shaft of the swing link and located above the first bracket portion.

[0011] According to a second aspect of the present invention, in the pedal support structure for a vehicle according to the first aspect, there is provided releasing means for releaseing the connection, established by the connecting link, between the other end portion of the swing link and the end portion of the vehicle pedal opposite to the pad when the distance between the rotation-center shaft and the swing-center shaft increases.

[0012] According to the first aspect of the present invention, when an external force greater than a predetermined value acts on the front portion of the vehicle, the displacement control means causes the distance between the rotation-center shaft of the vehicle pedal and the swing-center shaft of the swing link to increase. Further, in this case, the connecting pin of the connecting link, which is offset substantially toward the front of the vehicle or toward the top of the vehicle from the line connecting the rotation-center shaft of the vehicle pedal and the swing-center shaft of the swing link, is displaced toward the line. Thus, a torque is applied to the vehicle pedal so as to turn the vehicle pedal about the rotation-center shaft toward the front of the vehicle. In this manner, the displacement of the pad of the vehicle pedal is controlled when an external force greater than a predetermined value acts on the vehicle from the front side thereof. When an external force greater than a predetermined value acts on the front portion of the vehicle, the displacement control means causes the second bracket disposed above the first bracket supporting the rotation-center shaft of the vehicle pedal to move away from the first bracket. Since the swing-center shaft of the swing link is supported by the second bracket, the distance between the swing-center shaft of the swing link and the rotation-center shaft of the vehicle pedal increases as the second bracket moves away from the first bracket.

[0013] According to the second aspect of the present invention, when the distance between the rotation-center shaft and the swing-center shaft increases, the releasing means releases the connection, established by the connecting link, between the other end portion of the swing link and the end portion of the vehicle pedal opposite to the pad. Accordingly, the vehicle pedal is released from the connecting link, thereby utilizing an inertial force directed substantially toward the front of the vehicle and acting on the vehicle pedal for displacing the pad of the vehicle pedal when an external force greater than a predetermined value acts on the vehicle from the front side thereof.

[0014] The above and other objects, features and advantages of the present invention will become apparent from the following description and the appended claims, taken in conjunction with the accompanying drawings in which preferred embodiments of the present invention are shown by way of illustrative example.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The invention will now be described with reference to the accompanying drawings wherein:

FIG. 1 is a side view showing a pedal support structure for a vehicle according to a first embodiment of the present invention;
FIG. 2 is a side view of the structure of FIG. 1 showing a state after an external force greater than a predetermined value acts on the vehicle from the front side thereof;
FIG. 3 is an enlarged side view showing a main portion of a pedal support structure for a vehicle according to a second embodiment of the present invention;
FIG. 4 is a side view of the structure of FIG. 3 showing a state after an external force greater than a predetermined value acts on the vehicle from the front side thereof; and
FIG. 5 is a perspective view showing a conventional structure.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Supplements to the Embodiments:

[0016]

(1) In the description of a second and subsequent embodiment, parts and portions identical to or substantially identical to those appearing in the description of a first embodiment are indicated by reference numerals identical to those of corresponding parts and portions appearing in the description of the first embodiment, and the descriptions of the structure, action, etc. of these parts and portions will be omitted.
(2) The embodiments described below encompass a suspension type main brake pedal. However, the present invention is not limited thereto, but is also applicable to a suspension type clutch pedal and a suspension type parking brake pedal.

First Embodiment:

[0017] A first embodiment of the present invention will now be described with reference to FIGS. 1 and 2.

[0018] FIG. 1 schematically-shows the side view of a suspension type brake pedal 10 and its peripheral structure. As shown in FIG. 1, a dash panel 16 is substantially vertically disposed so as to separate an engine room 12 from a compartment space 14. On the front side of the dash panel 16, there are integrally disposed a brake booster 18 for boosting a treading force applied by an occupant to the brake pedal 10, a master cylinder 20 for converting a pressure boosted by the brake booster 18

to a fluid pressure, and a reservoir tank 22 for storing and replenishing brake fluid in accordance with a change of volume of a hydraulic system.

[0019] A link support 24 is disposed on the rear side of the dash panel 16. This link support 24 comprises a base plate 26 and a side plate 28. The base plate 26 is disposed in parallel with the dash panel 16. The side plate 28, having a substantially rectangular shape, is supported by the base plate 26 in a cantilever manner and extends toward the rear of the vehicle such that its plane is oriented along the longitudinal direction of the vehicle.

[0020] A plurality of cylindrical collars 30 are fixed on the front-side surface of the base plate 26 of the link support 24 at predetermined positions. These collars 30 abut the dash panel 16 such that stud bolts 32 projecting from the brake booster 18 are inserted into the corresponding collars 30. Nuts 34 are screwed onto the stud bolts 32 from the compartment side, so that the link support 24 is fixed onto the dash panel 16. An unillustrated dash insulator, serving as a noise insulating material, is interposed between the dash panel 16 and the base plate 26. Alternatively, nuts may be welded onto the front-side surface of the dash panel 16, and mounting bolts may be passed through the base plate 26 and screwed into the welded nuts to thereby fix the base plate 26 onto the dash panel 16.

[0021] A swing-center shaft 38 for a swing link 36, having a boomerang-like shape as viewed from its side, is supported by the link support 24 at its rear end portion. The swing-center shaft 38 is located at the intermediate portion of the swing link 36. The upper end portion of the swing link 36 is connected to the tip portion of a push rod 40 projecting from the brake booster 18 such that the swing link 36 can rotate about a hinge pin 42 located at the tip portion of the push rod 40.

[0022] A pedal support 44, having a substantially triangular shape as viewed from its side, is disposed under the link support 24. Cylindrical collars 30 are fixed on the front-side surface of the bottom end portion of the pedal support 44 at predetermined positions. The collars 30 also abut the dash panel 16. Mounting bolts 48 are inserted into the collars 30 from the compartment side and are screwed into nuts 46 welded onto the front-side surface of the dash panel 16, thereby fixing the pedal support 44 onto the dash panel 16.

[0023] The upper front end portion of the pedal support 44 and the lower front end portion of the link support 24 are pivotably connected by a support shaft 50. A rotation-center shaft 56 of the brake pedal 10 is supported by the pedal support 44 at its upper rear end portion. The brake pedal 10 comprises a pedal support member 52 formed by adequately bending a narrow plate material and a pedal pad 54 attached to the bottom end portion of the pedal support member 52. The rotation-center shaft 56 is located at the intermediate portion of the pedal support member 52 offset toward the top end of the pedal support member 52. The rotation-center shaft 56 is pivotably engaged with a cut-away portion 58 having an inverse U-shape and formed in the side plate 28 of the link support 24 at its lower rear end portion.

[0024] The upper end portion of the pedal support member 52 and the lower end portion of the swing link 36 are pivotably connected via a straight connecting link 60. Specifically, the front end portion of the connecting link 60 and the upper end portion of the pedal support member 52 are hinged by a first connecting pin 62, while the rear end portion of the connecting link 60 and the lower end portion of the swing link 36 are hinged by a second connecting pin 64. Further, the first connecting pin 62 is offset substantially toward the front of the vehicle from a line P connecting the rotation-center shaft 56 of the brake pedal 10 and the swing-center shaft 38 of the swing link 36.

[0025] Next, the operation and effects of the present embodiment will be described.

[0026] In an ordinary traveling state of the vehicle, the brake pedal 10 is held at its initial position by the urging force of a return spring. In this state, when a occupant applies a treading force to the pedal pad 54 of the brake pedal 10, the brake pedal 10 swings about the rotation-center shaft 56 toward the front of the vehicle. This swing motion is transmitted to the swing link 36 via the connecting link 60, thereby causing the swing link 36 to swing about the swing-center shaft 38 in a counterclockwise direction on FIG. 1. This causes the push rod 40 to be pushed substantially toward the front of the vehicle. As a result, the treading force applied to the pedal pad 54 by the occupant is boosted by the brake booster 18.

[0027] Since the rotation-center shaft 56 of the brake pedal 10 is located under a line along which a load F acts on the swing-center shaft 38 substantially toward the rear of the vehicle upon an ordinary braking operation, a support rigidity is sufficiently secured during the ordinary braking operation, so that the feeling of a pedal operation is not impaired.

[0028] By contrast, when an external force greater than a predetermined value acts on the vehicle from the front side thereof, the load corresponding to the external force is input to the dash panel 16 via a front-side member, and thus the dash panel 16 may bend toward the rear of the vehicle as shown in FIG. 2. In such a case, the link support 24 turns upward (is pushed upward) about the support shaft 50, so that the cut-away portion 58 formed in the link support 24 is disengaged from the rotation-center shaft 56 of the brake pedal 10. This causes a distance A (see FIG. 1) between the rotation-center shaft 56 of the brake pedal 10 and the swing-center shaft 38 of the swing link 36 to increase to a distance A' (see FIG. 2). Also, the connecting link 60 is substantially aligned with the line P connecting the rotation-center shaft 56 and the swing-center shaft 38. That is, in addition to the second connecting pin 64, which connects the connecting link 60 and the swing link 36, the first connecting pin 62, which connects the connecting link

60 and the pedal support member 52, is drawn toward the line P. As a result, a torque is applied to the brake pedal 10 such that the brake pedal 10 turns about the rotation-center shaft 56 so as to mov the pedal pad 54 substantially toward the front of the vehicle.

[0029] As described above, in the present embodiment, the swing link 36 and the brake pedal 10 are connected by the connecting link 60, and the link support 24, which supports the swing-center shaft 38 of the swing link 36, is separably engaged with the pedal support 44, which supports the rotation-center shaft 56 of the brake pedal 10. Furthermore, the first connecting pin 62, which connects the connecting link 60 and the brake pedal 10, is offset substantially toward the front of the vehicle from the line P connecting the rotation-center shaft 56 and the swing-center shaft 38. Therefore, when an external force greater than the predetermined value acts on the vehicle from the front side thereof, the distance between the rotation-center shaft 56 and the swing-center shaft 38 is increased from A to A', so that the first connecting pin 62 can be drawn toward the line P. Thus, the pedal pad 54 of the brake pedal 10 can be displaced substantially toward the front of the vehicle. In other words, according to the present embodiment, when an external force greater than the predetermined value acts on the vehicle from the front side thereof, the associated deformation of the dash panel 16 is utilized for displacing the pedal pad 54 substantially toward the front of the vehicle. As a result, when an external force greater than the predetermined value acts on the vehicle from the front side thereof, an occupant's legs can be prevented from excessively bending about the knees, which would otherwise result due to an inertial movement of the occupant. This makes it possible to keep the occupant's knees away from a steering column.

[0030] In the present embodiment, the pedal bracket is divided into the link support 24, which supports the swing-center shaft 38 of the swing link 36, and the pedal support 44, which supports the rotation-center shaft 56 of the brake pedal 10. Therefore, when an external force greater than the predetermined value acts on the vehicle from the front side thereof, the distance between the rotation-center shaft 56 and the swing-center shaft 38 can be increased merely by turning the link support 24 relative to the pedal-support 44 about the support shaft 50. That is, the distance between the rotation-center shaft 56 and the swing-center shaft 38 can be increased through the employment of a simple structure. In other words, the present embodiment provides a simple structure.

[0031] In the present invention, the pedal bracket comprises two separate members, i.e. the link support 24 and the pedal support 44. However, the present invention is not limited thereto. The link support 24 and the pedal support 44 may be formed as a single member. In this case, a crack-generating portion such as a slit, a thin-walled portion, or the like may be provided so that a portion corresponding to the link support 24 can separate from a portion corresponding to the pedal support 44 when an external force greater than the predetermined value acts on the vehicle from the front side thereof.

Second Embodiment:

[0032] A second embodiment of the present invention will next be described with reference to FIGS. 3 and 4.

[0033] As shown in FIGS. 3 and 4, the overall structure of the present embodiment is similar to that of the first embodiment FIG. 3 is an enlarged side view of a main portion of the present embodiment.

[0034] In the present embodiment, among the holes which are formed at the opposite ends of the connection link 60 for engagement with the first and second connecting pins 62 and 64, the hole 70 formed for engagement with the first connecting pin 62 has a keyhole-like shape such that it is open to the exterior of the connecting link 60.

[0035] In the above-described structure, the peripheral portion of the hole 70 does not plastically deform during ordinary braking operation, so that ordinary braking operation is not hindered.

[0036] By contrast, when an external force greater than the predetermined value acts on the vehicle from the front side thereof, the link support 24 turns upward about the support shaft 50 in a manner similar to that of the first embodiment. Accordingly, there increases the distance between the rotation-center shaft 56 of the brake pedal 10 and the swing-center shaft 38 of the swing link 36.

[0037] In this case, when the connecting link 60 is brought substantially onto the line P connecting the rotation-center shaft 56 and the swing-center shaft 38 as shown in FIG. 2, and the link support 24 attempts to further turn upward about the support shaft 50, a tensile load acts on the peripheral portion of the hole 70 in the connecting link 60. Therefore, the peripheral portion of the hole 70 plastically deforms, resulting in a breakaway of the connecting link 60 from the first connecting pin 62, as shown in FIG. 4. Accordingly, the brake pedal 10 is released from the restricted state established by the connecting link 60. As a result, an inertial force acting on the brake pedal 10 substantially toward the front of the vehicle is utilized for displacing the pedal pad 54 substantially toward the front of the vehicle to an extent greater than that in the first embodiment.

[0038] In the present embodiment, only the hole 70 to be engaged with the first connecting pin 62 is formed into a keyhole-like shape in the connecting link 60. However, the present invention is not limited thereto. Only a hole to be engaged with the second connecting pin 64 or both holes may be formed into a keyhole-like shape.

[0039] Also, in the present embodiment, through the employment of the keyhole-shaped hole 70 formed in the connecting link 60, the connecting link 60 is allowed to break away, as needed, from the first connecting pin

62. However, the present invention is not limited thereto. A cut-away portion or a thin-walled portion may be provided in the connecting link 60 at its intermediate portion, so that the connecting link 60 breaks at its intermediate portion.

[0040] While the embodiments of the present invention, as herein disclosed, constitute a preferred form, it is to be understood that other forms might be adopted.

Claims

1. A pedal support structure for a vehicle comprising:

   a pedal bracket fixed on a vehicle body and supporting a rotation-center shaft (56) of a suspension type vehicle pedal (10);

   a swing link (36) which is supported by said pedal bracket in a manner swingable about a swing-center shaft (38), one end portion of said swing link (36) being connected to operating-force transmission means which transmits a treading force applied to the pad (54) of the vehicle pedal (10) to treading-force boosting means;

   a connecting link (60) which connects the other end portion of said swing link (36) and one end portion of said vehicle pedal (10) opposite to the pad (54) in a relatively rotatable manner, said connecting link (60) transmitting a rotational force of said vehicle pedal (10), generated about said rotation-center shaft (56) toward the front of the vehicle, to said operating-force transmission means via said swing link (36), and a connecting pin (62) of said connecting link (60) for connection with the end portion of said vehicle pedal (10) opposite to the pad (54) being offset substantially toward the front of the vehicle from a line connecting said rotation-center shaft (56) of said vehicle pedal (10) and said swing-center shaft (38) of said swing link (36); and

   displacement control means which operates, when an external force greater than a predetermined value acts on the front portion of the vehicle, so as to increase the distance between said rotation-center shaft (56) and said swing-center shaft (38) and to move said connecting pin (62) such that said connecting pin (62) approaches the line, thereby displacing the pad (54) of said vehicle pedal (10),

   wherein said pedal bracket includes a first pedal bracket portion (44) and a second bracket portion (24), said first pedal bracket portion (44) supporting said rotation-center shaft (56) of said vehicle pedal (10) and said second pedal bracket portion (24) supporting said swing-center shaft (38) of said swing link (36) and located above said first bracket portion (44).

2. A pedal support structure for a vehicle according to Claim 1, **characterized in that** said treading-force boosting means is a brake booster (18), and said operating-force transmission means is a push rod (40) projecting from said brake booster (18).

3. A pedal support structure for a vehicle according to Claim 1 or 2, **characterized in that** an upper front end portion of said first bracket (44) is connected to a lower front end portion of said second bracket (24) via a rotary support shaft (50) in a relatively rotatable manner.

4. A pedal support structure for a vehicle according to Claim 3, **characterized in that** an inverse-U-shaped cut-away portion (58) is formed in a lower rear end portion of said second bracket (24), and said rotation-center shaft (56) of said vehicle pedal (10) provided on said first bracket (44) is engaged with said cut-away portion (58) in a relatively rotatable manner.

5. A pedal support structure for a vehicle according to Claim 1 or 2, **characterized in that** said first and second brackets (44, 24) are formed as a single member having a crack-generating portion so that a portion of said member corresponding to said second bracket (24) separates from a portion of said member corresponding to said first bracket (44) when an external force greater than the predetermined value acts on the vehicle from the front side thereof.

6. A pedal support structure for a vehicle according to any one of Claims 1 - 5, **characterized by** further comprising releasing means for releasing the connection, established by said connecting link (60), between the other end portion of said swing link (36) and the end portion of said vehicle pedal (10) opposite to the pad (54) when the distance between said rotation-center shaft (56) and said swing-center shaft (38) increases.

7. A pedal support structure for a vehicle according to Claim 6, **characterized in that** at least one of the holes that are formed at the opposite ends of said connecting link (60) for engagement with said connecting pin (62) and a second connecting pin (64) for connection with the other end of said swing link (36) is formed in a keyhole-like shape which is opened to the peripheral edge of said connecting link (60), thereby constituting said releasing means.

8. A pedal support structure for a vehicle according to Claim 6, **charact rized in that** said releasing means is a crack-generating portion provided in said connecting link (60) at its intermediate portion.

Patentansprüche

1. Pedalstützstruktur für ein Fahrzeug, die aufweist:

eine Pedalhalterung, die an einer Fahrzeugkarosserie befestigt ist und die eine Rotationsmittelpunkt-Welle (56) eines aufgehängten Fahrzeugpedals (10) stützt,
eine Schwenkverbindung (36), die durch die Pedalhalterung in einer Weise gestützt ist, dass diese um eine Schwenkmittelpunkt-Welle (38) schwenkbar ist, wobei ein Endabschnitt der Schwenkverbindung (36) mit einer Betriebskraft-Übertragungseinrichtung verbunden ist, die eine Trittkraft, die auf die Auflage (54) des Fahrzeugpedals (10) aufgebracht wird, zur Trittkraftverstärkungseinrichtung überträgt,
ein Verbindungsglied (60), das den anderen Endabschnitt der Schwenkverbindung (36) und einen Endabschnitt des Fahrzeugpedals (10), der zur Auflage (54) entgegengesetzt liegt, in einer in Bezug zueinander rotierenden Weise verbindet, wobei das Verbindungsglied (60) eine Rotationskraft des Fahrzeugpedals (10), die um die Rotationsmittelpunkt-Welle (56) zur Vorderseite des Fahrzeugs erzeugt wird, zur Betriebskraft-Übertragungseinrichtung über die Schwenkverbindung (36) überträgt und wobei ein Verbindungsstift (62) des Verbindungsgliedes (60) zur Verbindung mit dem Endabschnitt des Fahrzeugpedals (10), der zur Auflage (54) entgegengesetzt liegt, im wesentlichen zur Vorderseite des Fahrzeugs von einer Linie versetzt ist, die die Rotationsmittelpunkt-Welle (56) des Fahrzeugpedals (10) und die Schwenkmittelpunkt-Welle (38) der Schwenkverbindung (36) verbindet, und
eine Verschiebungsteuerungseinrichtung, die betrieben wird, wenn eine äußere Kraft, die größer als ein vorbestimmter Wert ist, auf die Vorderseite des Fahrzeugs wirkt, um den Abstand zwischen der Rotationsmittelpunkt-Welle (56) und der Schwenkmittelpunkt-Welle (38) zu erhöhen und den Verbindungsstift (62) zu bewegen, so dass sich der Verbindungsstift (62) an die Linie annähert, wodurch die Auflage (54) des Fahrzeugpedals (10) verschoben wird,

wobei die Pedalhalterung einen ersten Pedalhalterungsabschnitt (44) und einen zweiten Halterungsabschnitt (24) aufweist, wobei der erste Pedalhalterungsabschnitt (44) die Rotationsmittelpunkt-Welle (56) des Fahrzeugpedals (10) stützt und der zweite Pedalhalterungsabschnitt (24) die Schwenkmittelpunkt-Welle (38) der Schwenkverbindung (36) stützt und sich über dem ersten Halterungsabschnitt (44) befindet.

2. Pedalstützstruktur für ein Fahrzeug nach Anspruch 1, **dadurch gekennzeichnet, dass** die Trittkraft-Verstärkungseinrichtung ein Bremskraftverstärker (18) ist und die Betriebskraftübertragungseinrichtung eine Druckstange (40) ist, die aus dem Bremsverstärker (18) vorsteht.

3. Pedalstützstruktur für ein Fahrzeug nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** ein oberer vorderer Endabschnitt der ersten Halterung (44) mit einem unteren vorderen Endabschnitt der zweiten Halterung (24) über eine Rotationsstützwelle (50) in einer in Bezug aufeinander rotierenden Weise verbunden ist.

4. Pedalstützstruktur für ein Fahrzeug nach Anspruch 3, **dadurch gekennzeichnet, dass** ein weggeschnittener Abschnitt (58) in Form eines umgekehrten U in einem unteren hinteren Endabschnitt der zweiten Halterung (24) ausgebildet ist und die Rotationsmittelpunkt-Welle (56) des Fahrzeugpedals (10), die an der ersten Halterung (44) vorgesehen ist, mit dem weggeschnitten Abschnitt (58) in einer in Bezug aufeinander rotierenden Weise in Eingriff steht.

5. Pedalstützstruktur für ein Fahrzeug nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die erste und die zweite Halterung (44, 24) als ein einziges Element mit einem Risserzeugungsabschnitt ausgebildet sind, so dass sich ein Abschnitt des Elements, der der zweiten Halterung (24) entspricht, von einem Abschnitt des Elements trennt, der der ersten Halterung (44) entspricht, wenn eine äußere Kraft, die größer als der vorbestimmte Wert ist, auf das Fahrzeug von seiner Vorderseite wirkt.

6. Pedalstützstruktur für ein Fahrzeug nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** diese ferner eine Freigabeeinrichtung zum Freigeben der Verbindung, die durch das Verbindungsglied (60) hergestellt wird, zwischen dem anderen Endabschnitt der Schwenkverbindung (36) und dem Endabschnitt des Fahrzeugpedals (10) aufweist, der zur Auflage (54) entgegengesetzt liegt, wenn sich der Abstand zwischen der Rotationsmittelpunkt-Welle (56) und der Schwenkmittelpunkt-Welle (38) erhöht.

7. Pedalstützstruktur für ein Fahrzeug nach Anspruch 6, **dadurch gekennzeichnet**, das zumindest eines der Löcher, die an den entgegengesetzten Enden

des Verbindungsgliedes (60) zum Eingriff mit dem Verbindungsstift (62) und einem zweiten Verbindungsstift (64) zur Verbidung mit dem anderen Ende der Schwenkverbindung (36) ausgebildet sind, in einer schlüssellochartigen Form ausgebildet ist, die zur peripheren Kante des Verbindungsgliedes (60) geöffnet ist, wodurch die Freigabeeinrichtung gebildet wird.

8. Pedalstützstruktur für ein Fahrzeug nach Anspruch 6, **dadurch gekennzeichnet, dass** die Freigabeeinrichtung ein Risserzeugungsabschnitt ist, der im Verbindungsglied (60) als sein Zwischenabschnitt vorgesehen ist.

Revendications

1. Structure support de pédale pour un véhicule comprenant :

un support de pédale fixé sur une carrosserie de véhicule et supportant un arbre de centre de rotation (56) d'une pédale de véhicule du type suspendu (10) ;
une biellette oscillante (36) qui est supportée par ledit support de pédale d'une manière oscillante autour d'un arbre de centre d'oscillation (38), une partie d'extrémité de ladite biellette oscillante (36) étant reliée à un moyen de transmission de la force d'actionnement qui transmet une force de pression du pied appliquée au patin (54) de la pédale du véhicule (10) au moyen d'augmentation de la force de pression du pied ;
une biellette de liaison (60) qui relie l'autre partie d'extrémité de ladite biellette oscillante (36) et une partie d'extrémité de ladite pédale du véhiculé (10) opposée au patin (54) d'une manière rotative relativement, ladite biellette de liaison (60) transmettant une force de rotation de ladite pédale du véhicule (10), générée autour dudit arbre de centre de rotation (56) vers l'avant du véhicule audit moyen de transmission de la force d'actionnement par l'intermédiaire de ladite biellette oscillante (36), et une goupille de liaison (62) de ladite biellette de liaison (60) pour la liaison avec la partie d'extrémité de ladite pédale du véhicule (10) opposée au patin (54) étant décalée sensiblement vers l'avant du véhicule à partir d'une ligne reliant ledit arbre de centre de rotation (56) de ladite pédale du véhicule (10) audit arbre de centre d'oscillation (38) de ladite biellette oscillante (36) ; et
un moyen de commande du déplacement qui fonctionne, lorsqu'une force supérieure à une valeur prédéterminée agit sur la partie avant du véhicule, de façon à augmenter la distance entre ledit arbre de centre de rotation (56) et ledit arbre de centre d'oscillation (38) et déplacer ladite goupille de liaison (62) de façon que ladite goupille de liaison (62) s'approche de la ligne, ce qui a pour effet de déplacer le patin (54) de ladite pédale du véhicule (10),

dans laquelle ledit support de pédale comprend une première partie de support de pédale (44) et une deuxième partie de support (24), ladite première partie de support de pédale (44) supportant ledit arbre de centre de rotation (56) de ladite pédale du véhicule (10) et ladite deuxième partie de support de pédale (24) supportant ledit arbre de centre d'oscillation (38) de ladite biellette oscillante (36) et étant située au-dessus de la première partie de support (44).

2. Structure support de pédale pour un véhicule selon la revendication 1, **caractérisée en ce que** ledit moyen d'augmentation de la force de pression du pied est un servofrein (18) et ledit moyen de transmission de la force d'actionnement est une tige de poussée (40) dépassant dudit servofrein (18).

3. Structure support de pédale pour un véhicule selon la revendication 1 ou 2, **caractérisée en ce qu'**une partie d'extrémité avant supérieure dudit premier support (44) est reliée à une partie d'extrémité avant inférieure dudit deuxième support (24) par l'intermédiaire d'un arbre support rotatif (50) d'une manière rotative relativement.

4. Structure support de pédale pour un véhicule selon la revendication 3, **caractérisée en ce qu'**une partie découpée en forme de U inversé (58) est formée dans une partie d'extrémité arrière inférieure dudit deuxième support (24) et ledit arbre de entre de rotation (56) de ladite pédale de véhicule (10) prévu sur ledit premier support (44) est engagé dans ladite partie découpée (58) d'une manière rotative relativement.

5. Structure support de pédale pour un véhicule selon la revendication 1 ou, 2, **caractérisée en ce que** lesdits premier et deuxième supports (44, 24) sont formés en un seul élément comportant une partie de génération de fissure de façon qu'une partie dudit élément correspondant audit deuxième support (24) se sépare d'une partie dudit élément correspondant audit premier support (44) lorsqu'une force externe supérieure à la valeur prédéterminée agit sur le véhicule à partir du côté avant de celui-ci.

6. Structure support de pédale pour un véhicule selon l'une quelconque des revendications 1 à 5, **caractérisée en ce qu'**elle comprend de plus un moyen

de désaccouplement pour désaccoupler la liaison établie par ladite biellette de liaison (60) entre l'autre partie d'extrémité de ladite biellette oscillante (36) et la partie d'extrémité de ladite pédale du véhicule (10) opposée au patin (54) lorsque la distance entre ledit arbre de centre de rotation (56) et ledit arbre de centre d'oscillation (38) augmente.

7. Structure support de pédale pour un véhicule selon la revendication 6, **caractérisée en ce qu'**un au moins des trous qui sont formés au niveau des extrémités opposées de ladite biellette de liaison (60) pour engagement avec ladite goupille de liaison (62) et d'une deuxième goupille de liaison (64) pour liaison avec l'autre extrémité de ladite biellette oscillante (36) est en forme de trou de serrure qui s'ouvre jusqu'au niveau du bord périphérique de ladite biellette de liaison (60), ce qui a pour effet de constituer ledit moyen de désaccouplement.

8. Structure support de pédale pour un véhicule selon la revendication 6, **caractérisée en ce que** ledit moyen de relâchement est une partie de génération de fissure prévue dans ladite biellette de liaison (60) au niveau de sa partie intermédiaire.

FIG. 1

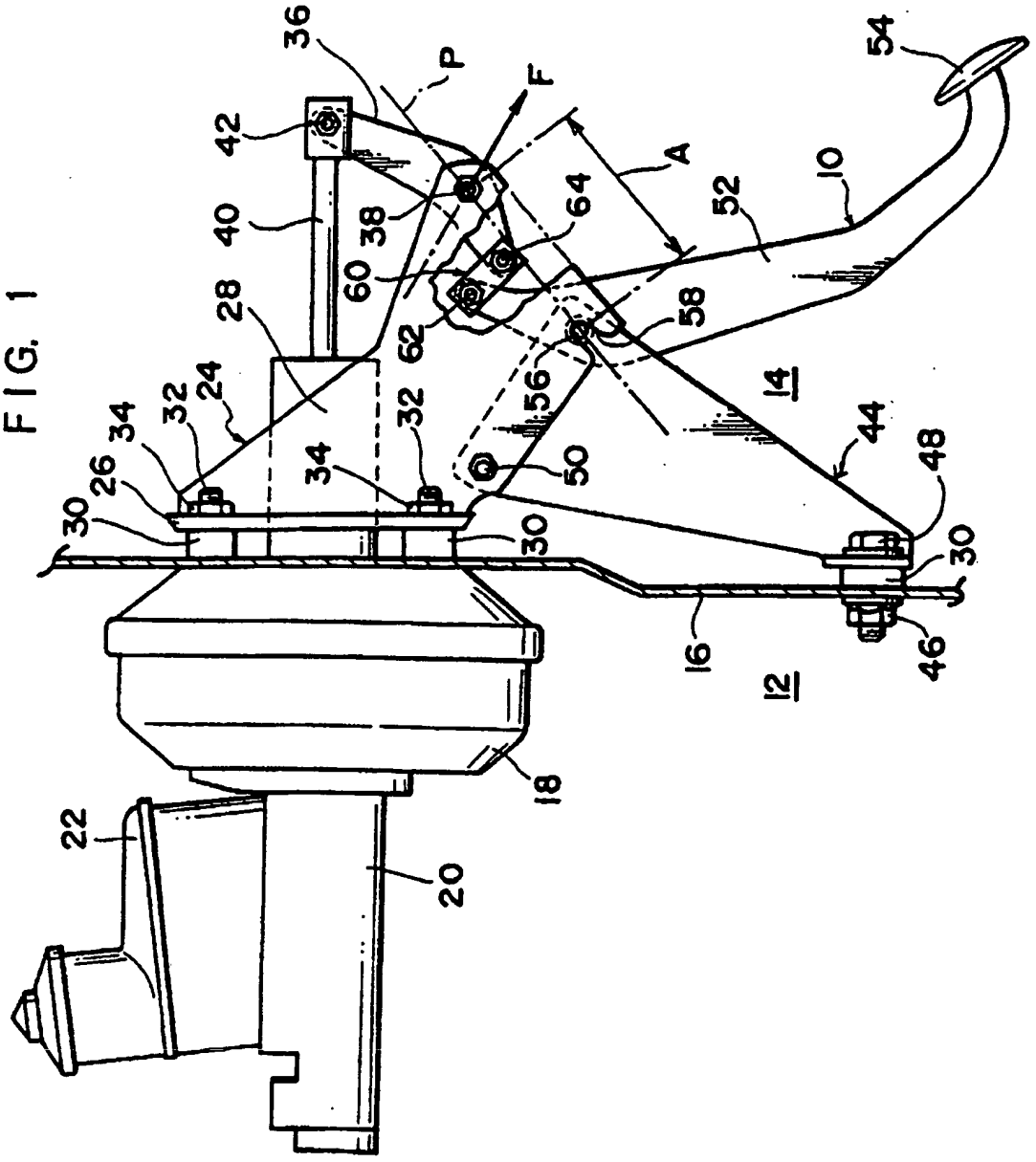
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FIG. 2

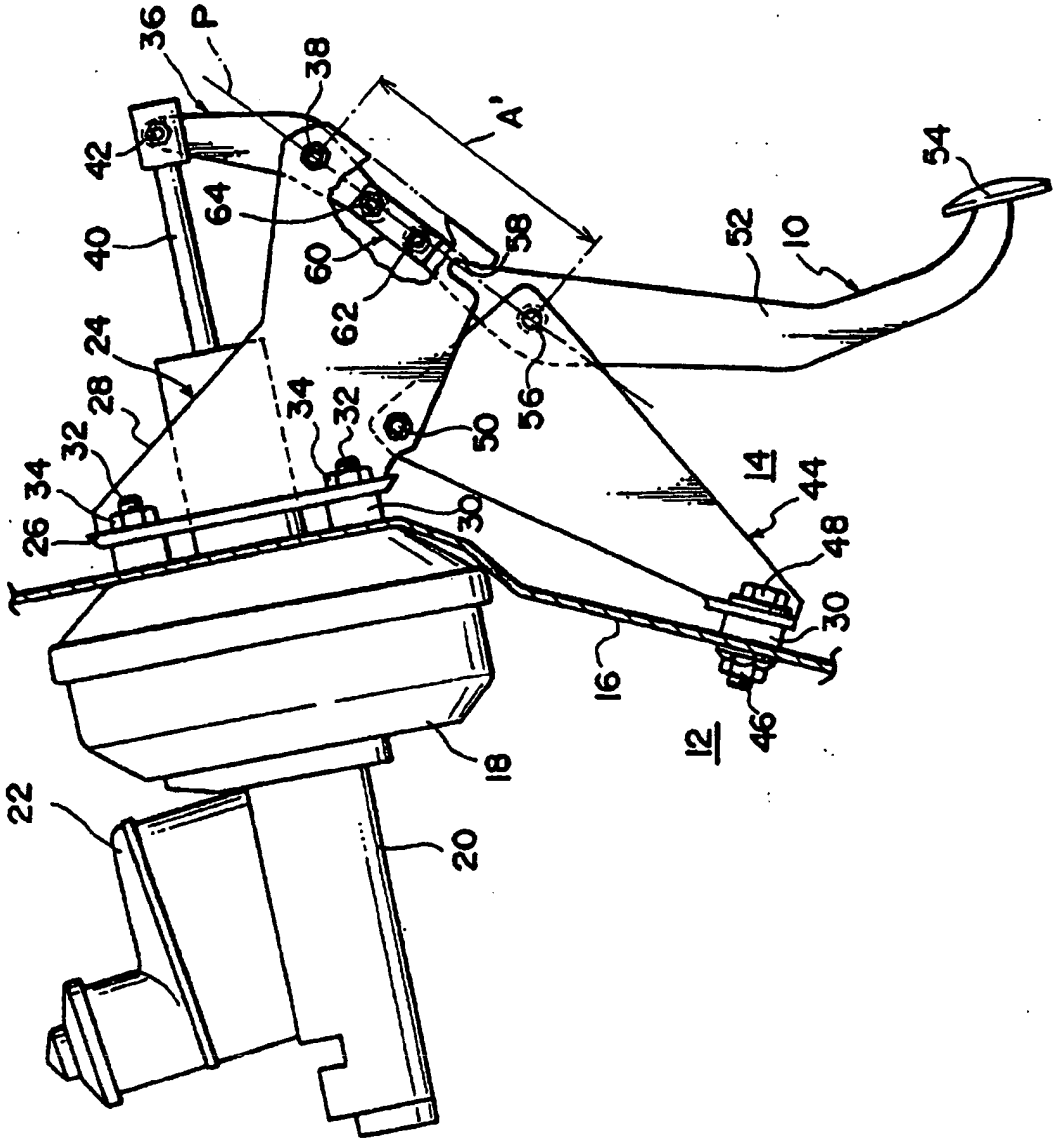
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FIG. 3

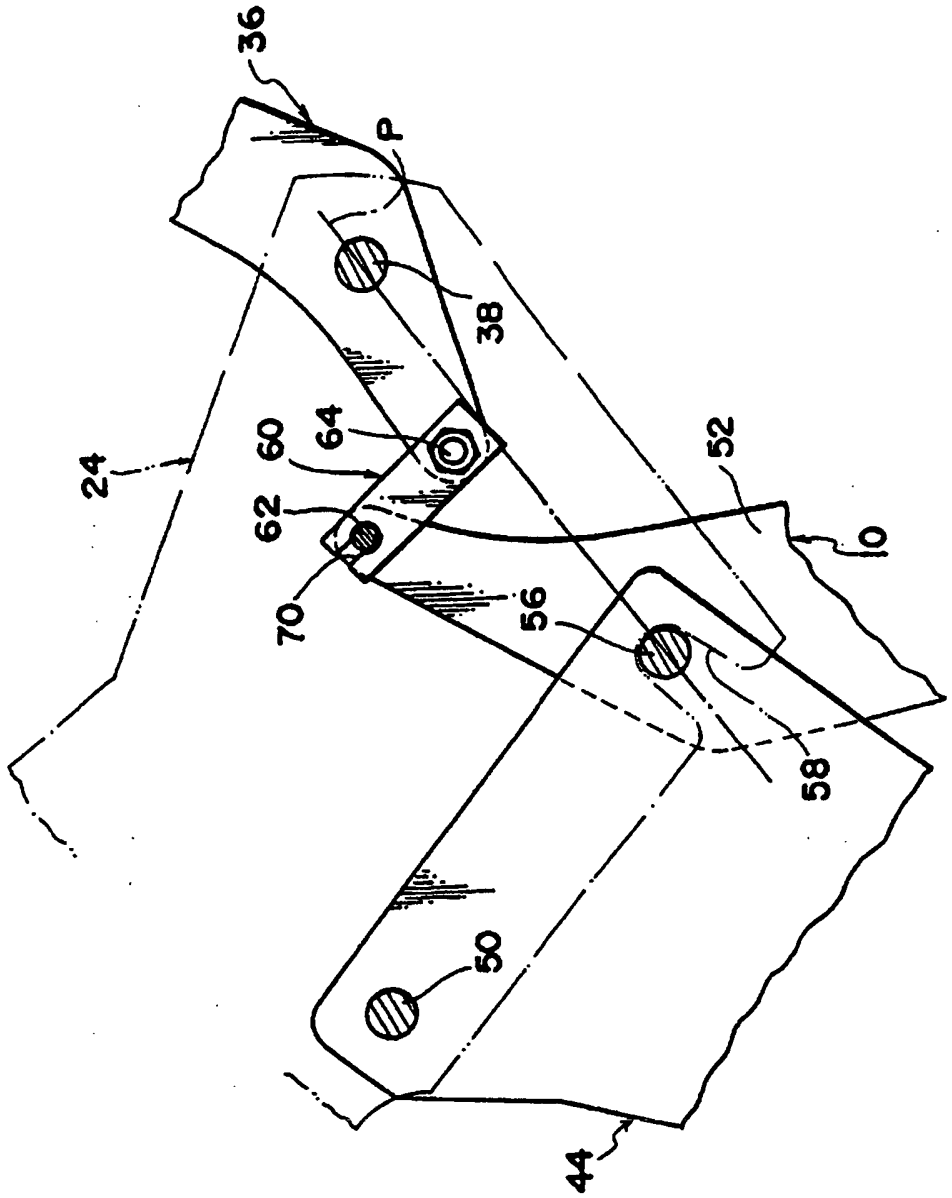
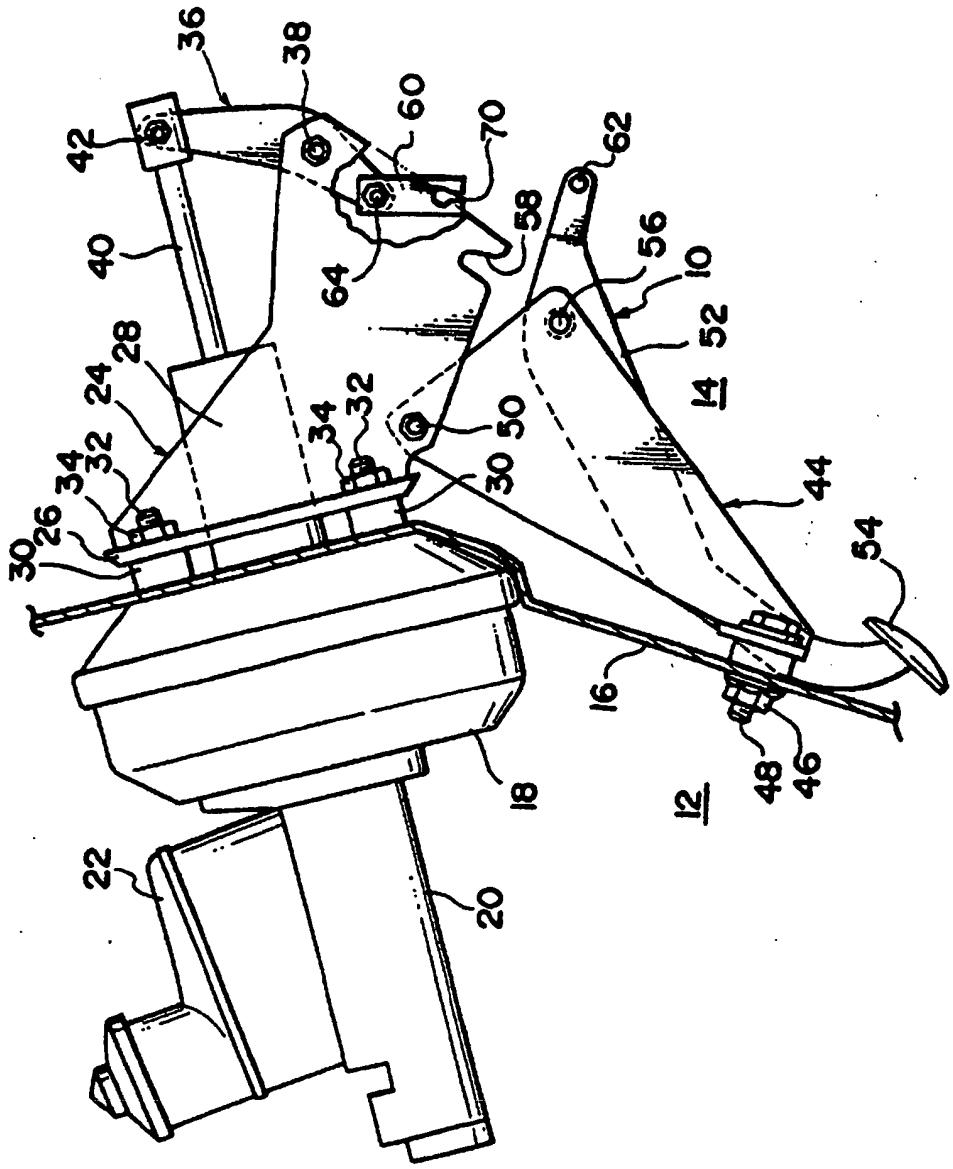


FIG. 4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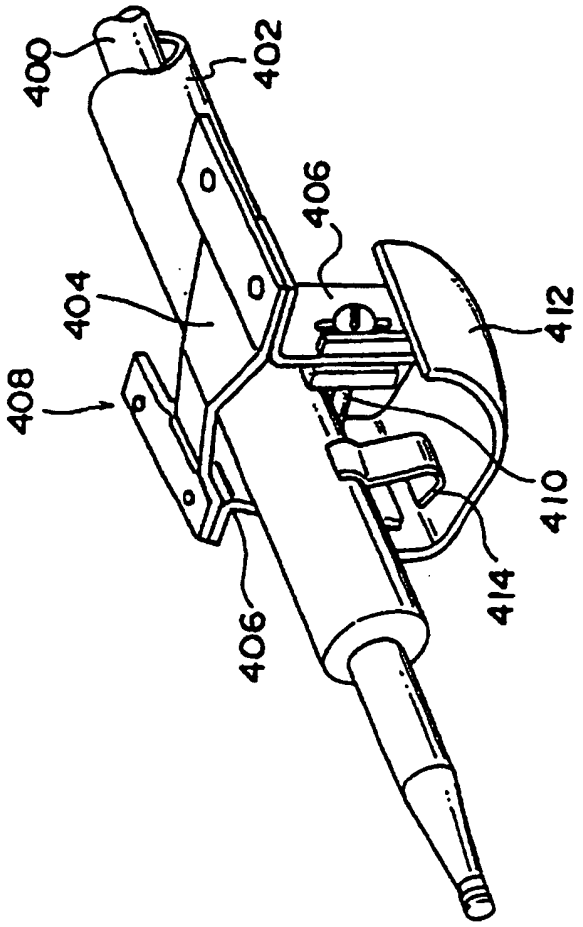

FIG. 5
RELATED ART